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EXAMINER	
MOORE, KARLA A	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,557	INAGAWA ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0603*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6, 8-10, 12-13, 15-21, 24-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,850071 to Makiguchi et al.

Makiguchi et al. disclose an apparatus for thermally processing large area substrates substantially as claimed and comprising: a chamber (25); a plurality of processing zones disposed in the chamber (column x, rows x); and a lift mechanism (28) coupled to the plurality of processing zones and adapted to vertically position the plurality of processing zones within the chamber, wherein each zone further comprises: an upper heated plate (40); and a lower heated plate (40) adapted to support a first large are substrate therein.

3. However, Makiguchi fails to explicitly teach an unheated plate adapted to support a second area large substrate thereon, the unheated plate deposed between the upper and lower heated plates.

4. Makiguchi et al. do however teach that each of the plates in the chamber is adapted so that the temperature may be individually controlled (from power source) so that different heating temperatures do not arise between high positioned substrates and low positioned substrates (column 4, rows 59-65).

5. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided any of the plates in Makiguchi et al. as unheated (by controlling the power supply) in order to avoid different heating temperatures between high positioned substrates and low positioned substrates as taught by Makiguchi et al.

6. With respect to claim 2, the lower heated plate further comprises: at least one heating element provided with a greater heat capacity along a first edge of the lower heated plate relative an adjacent

second edge of the lower heated plate. Makiguchi et al. teach that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5).

7. With respect to claim 3, the lower heated plate further comprises: a first heating zone; and a second heating zone controlled independently of the second heating zone. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5).

8. With respect to claims 4-5, the lower heated plate further comprises: a first heater disposed in the first heating zone; and a second heater disposed in the second heating zone. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

9. With respect to claim 6, the lower heated plate further comprises: a first plate; a second plate disposed adjacent to the first plate and forming a substrate supporting surface therewith; a first heater disposed on the first plate; and a second heater disposed on the second plate. In Makiguchi et al. there is a plurality of plates, each of which is capable of zone heating using individual heaters (heating wires).

10. With respect to claim 8, the lower heated plate includes: a plurality of substrate supports (43) extending from the lower heated plate and adapted to support the first substrate in a spaced-apart relation relative to the lower heated plate.

12. With respect to claim 9, the plurality of processing zones are vertically stacked. See Figure 1.

13. With respect to claim 10, the plurality of vertically stacked process zones further comprises: a lower heating zone immediately above the lower heating zone, wherein an upper heated plate of the lower processing zone is a lower heated plate of the upper processing zone. See Figure 1.

14. With respect to claim 12, the unheated plate is at least partially fabricated from aluminum, nickel, steel, stainless steel or combinations thereof (column 4, rows 29-31).

11. With respect to claim 13, the unheated plate further comprises: a first plate; a second plate disposed adjacent to the first plate and forming a substrate support surface therewith. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

15. With respect to claim 15, Makiguchi et al. disclose an apparatus for thermally processing large are substrates substantially as claimed and comprising: a chamber (25) having a substrate transfer window (57) formed therein; a plurality of vertically stacked heated plates (40), at least one of the heated plates adapted to support a first large area substrate (23); and a lift mechanism (28) coupled to the plurality of heated and adapted to selectively position at least one of the plurality of the plates adjacent the window.

16. However, Makiguchi et al. fail to teach a plurality of unheated plates having at least one unheated plate disposed between each pair of heated plates, at least one of the unheated plates adapted to support a second large area substrate.

12. Makiguchi et al. do however teach that each of the plates in the chamber is adapted so that the temperature may be individually controlled (from power source) so that different heating temperatures do not arise between high positioned substrates and low positioned substrates (column 4, rows 59-65).

13. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided any of the plates in Makiguchi et al. as unheated (by controlling the power supply) in order to avoid different heating temperatures between high positioned substrates and low positioned substrates as taught by Makiguchi et al.

14. With respect to claims 16, at least one of the heated plates further comprises: at least one heating element provided with a greater heat capacity along a first edge of the lower heated plate relative an adjacent second edge of the lower heated plate. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that

the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

15. With respect to claim 17, at least a first heated plate of the plurality of heated plates further comprises: a first heating zone; and a second heating zone controlled independently of the second heating zone. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

16. With respect to claim 18, the first heated plate further comprises: a first heater disposed in the first heating zone; and a second heater disposed in the second heating zone. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

17. With respect to claim 19, the first heater is disposed outward of the second heater and along a first edge of the first heated plate, the first heater having greater heating capacity than the second heater disposed inward of the first heater. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

17. With respect to claim 20, the first heated plate is substantially rectangular. See Figure 2.

18. With respect to claim 21, the first heated plate further comprises: a first plate member having the first heater disposed thereon; and a second plate member disposed adjacent the first plate member and having the second heater disposed thereon. In Makiguchi et al. there is a plurality of plates, each of which is capable of zone heating using individual heaters (heating wires).

18. With respect to claim 24, Makiguchi et al. disclose an apparatus for thermally processing large area substrates substantially as claimed and comprising: a lower chamber body (25a); an upper chamber body (25b); a connecting member (sidewalls) coupling the lower and upper chamber bodies and defining

a chamber therewith; a large area substrate storage cassette (27) disposed within the chamber; and a lift mechanism (28) coupled to the cassette and adapted to vertically position the cassette within the chamber; wherein the cassette further comprises: a plurality of vertically stacked heated (40) plates adapted to support a first large area substrate.

19. However, Makiguchi et al. fail to teach a plurality of unheated plates disposed between each pair of heated plates, at least one of the unheated plates adapted to support a second large area substrate.

19. Makiguchi do however teach that each of the plates in the chamber is adapted so that the temperature may be individually controlled (from power source) so that different heating temperatures do not arise between high positioned substrates and low positioned substrates (column 4, rows 59-65).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided any of the plates in Makiguchi et al. as unheated (by controlling the power supply) in order to avoid different heating temperatures between high positioned substrates and low positioned substrates as taught by Makiguchi.

21. With respect to claim 25, at leas one of the heated plates further comprises: at least one heating element providing a greater heat density along a first edge of the lower heated plate relative to an adjacent second edge of the heated plate. Makiguchi e al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5)

22. With respect to claim 26, at least a first heated plate of the plurality of heated plates further comprises: a first plate member; and a second plate member forming a substrate support surface with the first plate member. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5).

23. With respect to claim 27, at least a first heated plate of the heated plates further comprises: a first heating zone; and a second heating zone controlled independently of the first heating zone. Makiguchi et

al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5).

24. With respect to claim 29, each pair of first heated plates having at least one unheated plate disposed therebetween defines an independently controllable heating zone. Makiguchi et al. teach that heater wires are disposed in each plate and that the heater wires embedded in the panel heaters may be divided into regions so that the supply of power to the heater wires in each region can be controlled individually (column 4, row 65 through column 5, row 5).

20. Claims 7, 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makiguchi et al. as applied to claims 1-6, 8-10, 12-13, 15-21, 24-27 and 29 above, and further in view of U.S. Patent No. 4,386,255 to Berkman et al.

21. Makiguchi et al. disclose the invention substantially as claimed and as described above.

22. However, Makiguchi et al. fail to teach any of the plates including one or more slots therethrough.

23. Berkman et al. teach the use of slots in a substrate supporting portion for the purpose of avoiding temperature gradients and providing an optimum temperature throughout the substrate supporting portion (column 3, rows 7-10).

24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided one or more slots in the substrate supporting surface of Makiguchi in order to avoid temperature gradients and provide an optimum temperature throughout the substrate supporting portion as taught by Berkman et al.

25. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makiguchi et al. as applied to claims 1-6, 8-10, 12-13, 15-21, 24-27 and 29 above, and further in view of U.S. Patent No. 6,046,435 to Holden et al.

26. Makiguchi et al. disclose the invention substantially as claimed and as described above.

27. However, Makiguchi et al. fail to teach an unheated plate is fabricated from glass, ceramic or combinations thereof.

28. Holden et al. teach the use of glass-ceramic material in a heating apparatus for large-area substrates because of the low thermal expansion of glass-ceramic material (column 3, rows 6-23).

29. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided glass ceramic as a material in the apparatus for processing large-area substrates of Makiguchi et al. in order to take advantage of the material's low thermal expansion as taught by Holden et al.

30. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makiguchi as applied to claims 1-6, 8-10, 12-13, 15-21, 24-27 and 29 above, and further in view of U.S. Patent No. 5,259,881 to Edwards et al. and U.S. Patent No. 4,979,464 to Kunze-Concewitz et al.

31. Makiguchi et al. disclose the invention substantially as claimed and as described above.

32. However, Makiguchi et al. fail to teach a vacuum pump coupled to a first port formed through the chamber; and a gas source coupled to a second port formed through the chamber.

33. Edwards et al. teach the use of a vacuum pump connected to a port in a batch preheating module for the purpose of maintaining the module at high vacuum (column 7, rows 8-25).

34. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a vacuum pump connected to a port in the apparatus of Makiguchi et al. in order to maintain the apparatus at high vacuum.

35. Kunze-Concewitz et al. teach the use of a gas source coupled to a port of a batch substrate processing apparatus for the purpose of introducing clean air into the apparatus and air conditioning of the apparatus (column 5, rows 22-32).

36. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a gas source couple to a port formed through the chamber of Makiguchi et al. in order to introduce clean air into the apparatus and air condition the apparatus as taught by Kunze-Concewitz et al.

37. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makiguchi as applied to claims 1-6, 8-10, 12-13, 15-21, 24-27 and 29 above, and further in view of U.S. Patent No. 3,832,815 to Balaz et al.

38. Makiguchi et al. disclose the invention substantially as claimed and as described above.

39. However, Makiguchi et al. fail to teach an insulation layer disposed over the chamber and having a thermal conductivity of less than about 0.035 watt (m-degrees Kelvin).

40. Balaz et al. teach the use of ceramic fiber blankets for the purpose of providing an insulation layer to a furnace that is characterized by good retardation of heat flow and permits rapid rates of heating and cooling with a concomitant economy of heat (column 1, rows 6-22).

41. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a ceramic fiber blanket with a low thermal conductivity in order to provide an insulation layer to a furnace that is characterized by good retardation of heat flow and permits rapid rates of heating and cooling with a concomitant economy of heat as taught by Makiguchi et al.

Conclusion

42. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP 5,607,009; USP 5,674,786; USP 6,399,923; USP 6,414,276; USP 6,506,994; USP 6,610,967; USP 6,688,375; USP Pub. 2004/0065656 A1; USP 6,723,964; USP 6,765,178; and USP 6,897,411 each teach thermal processing of flat substrates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karla Moore
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Art Unit 1763
June 26, 2005